

REMARKS

Applicant appreciates the thorough examination of the present application that is reflected in the Official Action of February 27, 2003. Applicant also appreciates the Examiner's indication that Claims 7-18 and 25-36 are allowed and that Claims 2, 4-6, 20 and 22-24 would be allowable if rewritten in independent form. Frankly, it would be a simple matter to rewrite the objected to claims in independent form and cancel the four rejected claims (Claims 1, 3, 19 and 21). However, upon careful analysis, Applicant respectfully submits that Claims 1, 3, 19 and 21 are not obvious over U.S. Patent 6,108,328 to Ranta et al. in view of U.S. Patent 6,177,906 to Petrus. Accordingly, Applicant respectfully requests reconsideration of the outstanding rejection for the reasons that will be described below.

In particular, Claim 1 recites:

1. A method of receiving a signal in the presence of noise and interference comprising the steps of:
demodulating the signal when a relationship between the signal and the noise and the interference meets a criterion; and
jointly demodulating the signal when the relationship between the signal and the noise and the interference does not meet the criterion. (Emphasis added.)

The Examiner concedes that "Ranta does not explicitly teach a criterion distinguishing between operation of demodulation and joint demodulation by a relationship between the signal, noise and interference", in Paragraph 2 of the Detailed Action. However, the Official Action cites Petrus in Paragraph 2 of the Detailed Action as teaching "estimation of signal to interference and noise ratio (SINR) as a criterion in determining further step." Applicant respectfully submits that the claims are unobvious over Ranta et al. in view of Petrus for the following reasons.

Ranta et al. teaches a joint demodulation method and, as understood by Applicant, provides no discussion or suggestion of performing regular demodulation. The Examiner appears to agree, but states that:

When the signal comprises only desired signal, the system shown does not need to perform operation with consideration by 23 and separate the desired signal from interference and noise. (Detailed Action, Paragraph 2.)

Thus, the Detailed Action appears to be asserting that, for a perfect signal, joint demodulation would not be performed by Ranta et al. However, as conceded by the Examiner in Paragraph 2 of the Detailed Action, there is no such thing as a perfect signal:

It is inherent that the system shown receives signal including noise as there is no perfect reception of signal.

Thus, Ranta et al. does not appear to describe any situation where demodulation of a signal, rather than joint demodulation of a signal, is used. Moreover, the reasoning that was used by the Detailed Action appears to be internally inconsistent in that it assumes that a perfectly received signal could be operated upon while at the same time conceding that there is no perfect reception of signal. Therefore, Applicant respectfully submits that a reasonable interpretation of Ranta et al. does not describe or suggest any of the above-underlined recitations of Claim 1.

Nor does Petrus supply the missing teaching. As acknowledged by Paragraph 2 of the Detailed Action "Petrus teaches estimation of a signal to interference in noise ratio (SINR) as a criterion in determining a further step." However, as noted in the Abstract of Petrus:

A method and apparatus is described for implementing adaptive smart antenna processing in a receiving communication station that includes an array of antennas and means for adaptive smart antenna processing, the method and apparatus including determining weight vectors for the adaptive smart antenna processing. Using the invention offers advantages when operating in a low SINR environment, for example, in a mobile environment in which the remote users are travelling at high speeds, hence the signals undergo fading. One aspect is hybrid weight adaptation that starts off with a method with good convergence properties, for example, one known to converge in a low SINR environment then switches to a method that converges rapidly, for example when started with relatively high quality initial conditions. To deal with high mobility, the weights determined from data at a particular burst are applied on that particular burst. Such weights may not be optimal for the subsequent bursts. When several users are present in a given channel, a multiport architecture is used to track each individual remote user. (Emphasis added.)

Thus, Petrus uses an SINR threshold at Block 311 to determine whether to apply constant modulus adaptation (Block 313) or decision directed adaptation (Block 317), but does not contain any suggestion to apply SINR considerations to the determination of whether to perform demodulation or joint demodulation. Applicant concedes that it is known to use SINR to determine various processing options in receivers. However, there is no description or suggestion in Petrus or in Ranta et al., to use a criterion to decide whether to demodulate or jointly demodulate the signal.

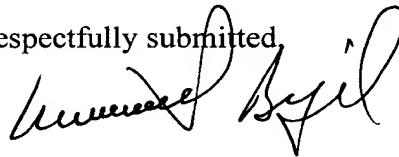
Finally, even if the references were combined, they would not describe or suggest the recitations of Claim 1. In particular, if the references were combined, joint demodulation would always be used as in Ranta et al., but SINR would be used to determine whether to use constant modulus adaptation or decision directed adaptation as in Petrus. The combination would not suggest the above-underlined recitations of Claim 1.

For at least these reasons, Claim 1 is patentable over Ranta et al. in view of Petrus. Claim 3 is patentable at least per the patentability of Claim 1 from which it depends. Moreover, Claim 3 is independently patentable because, even according to the Detailed Action's reasoning, Petrus' threshold would be 0, so that joint demodulation would always be performed. There is no description or suggestion in Petrus of using a real world, non-zero threshold. Claims 19 and 21 are system analogs of Claims 1 and 3, and are patentable for the same reasons that were described above.

Applicant also has amended Claim 4 to provide proper antecedent basis in line 3. The claim objection in Paragraph 1 of the Detailed Action is thereby overcome.

In conclusion, Applicant again wishes to thank the Examiner for the thorough examination and for the indication that all but four of the claims are allowable. As shown above, however, these four claims are patentable over the cited references. Accordingly, Applicant respectfully requests reconsideration of the outstanding rejections and allowance of the present application.

Respectfully submitted,



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